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OBSERVATIONS ON THE VEGETATION OF KANNIYAKUMARI DISTRICT, TAMIL NADU

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Kanniyakumari District in Tamil Nadu which is situated in the southern tip of the Indian peninsula, covers an area of about 1672 sq. km and lies approximately within 77° 7′—77° 35′ E and 8° 5′—8° 35′ N, surrounded by three seas (Gulf of Manaar, Indian Ocean and Arabian Sea), Southern Western ghats and plains of Kerala.

Most of the district is composed of gneissic rocks (Foote, 1884). The soils are red, varying in the quantity of their ferruginous element.

The annual rainfall varies at different places and ranges from about 89 cm at Kanniyakumari to 254 cm at Pechiparai. The annual mean temperature is about 26° C.

The earlier workers who made contributions to the vegetation/flora of this district include Lawson (1894), Bourdillon (1908), Rama Rao (1914), Jacob (1942), Lawrence (1959 & 1960), Nayar (1959), Subramanyam & Nayar (1965), Govindarajulu (1966, 1970, 1972 & 1973), Vasudevan (1967), Henry & Subramanyam (1972), Rao *et al.* (1974), Banerjee & Banerjee (1975), Nair & Ghosh (1976) and Sharma *et al.* (1976).

Topographically this district may be broadly classified as coastal region, middle region and mountainous region. The coastal region which stretches from south east to west, has small townships like Vattakottai, Anjugramam etc., on the south east and Colachal, Muttom, Thengapatnam etc., on the west coast. The coast is rocky and in places like Muttom stretches of rocks were observed along the coast.

Middle region (plains) contains large number of perennial and ephemeral tanks and irrigation canals showing the richness of hydrophytes. Small townships are often seen surrounded by paddy fields. Coconut, Banana and Jack are some of the commonly cultivated plants.

The mountainous region of the Southern ghats, provides a continuous wall along the northern side of the district. Many estates of Rubber, Cardamom, Tapioca etc., are present in these hilly ranges. Mahendragiri is the highest peak of this district reaching an altitude of about 1800 m. Muthukuzhivayal (*ca* 1500 m) is floristically the richest region of the district once proposed to be conserved as a Wild Life Sanctuary (Juan Spillett, 1968) but shelved due to a hydro electric project in this area. The real southern termination of the Southern Ghats occurs near Aramboly pass (Aralvaimozhi) where the high mountains slope down. Southward of the pass rises the perfectly detached Kathadimalai, a fine rocky mass, which sends off a rocky spur extending southward with two breaks for a distance of about 6 km and terminating in Maruthuvamalai, about 5 km north west of Kanniyakumari.

The main rivers of this district are Kodayar, Tambaraparani, Kalikesam, Valliyar and Palayar. Tambaraparani is wide and deep. At Thengapatnam after forming a small delta it flows into the Arabian Sea.

This district is one of the botanically rich areas of Peninsular India. The richness and diversity of the flora of this region are due to the variation in its elevation from sea level to about 1800 m, tropical climate, heavy rainfall and the mountainous configuration. The vegetation may be broadly classified under the following types : Southern tropical thorn forests ; Southern tropical dry deciduous ; Southern tropical moist deciduous ; Southern tropical wet evergreen, and Grassy swards (Grass lands).

Southern tropical thorn forests :

This type of forest covers the coastal region up to an elevation of about 200 m in places like Anjugramam, Vattakottai, Kanniyakumari, Nagercoil, Maruthuvamalai, Colachal and Kuzhithurai. This district has a coastal line of about 70 km. The umbrella tree, *Acacia planifrons* Wight & Arn., is commonly seen around Kanniyakumari, but towards west of Kanniyakumari it becomes rare and gradually disappears. Some of the other plants commonly seen in the coastal region are : *Azima tetracantha* Lamk., *Casuarina equisetifolia* Forst., *Dodonaea viscosa* N. Jacq., *Euphorbia tirucalli* L., *Ipomoea pes-caprae* Sweet, *Launea sarmentosa* (Willd.) Alston, *Lepidagathis pungens* Nees, *Maerua apetala* (Roth) Jacobs and *Spinifex littoreus* Merr., *Jatropha maheshwarii* Subr. & Nayar is common in and around Kanniyakumari. *Rhynchosia velutina* Wight & Arn., is rediscovered in this region. The sea coast has no mangrove flora. However, on the west the backwaters at the mouths of several rivers and canals connecting them are often thickly fringed with *Pandanus tactorius* Soland. *Acrostichum aureum* L., and *Excoecaria agallocha* L., are generally very conspicuous among the smaller bushes standing in shallow waters. In the Thengapatnam—Munjirai region along the backwaters, *Barringtonia racemosa* Roxb., *Ixora coccinea* L. and *Nauclea missionis* Wight & Arn., are seen.

The interior plains support a scrub flora. *Borassus flabellifer* L., is luxuriant and noticeable more towards the east coast. Some of the common trees of the plains are *Cassia siamea* Lamk., *Dichrostachys cinerea* (L.) Wight & Arn., *Morinda coreia* Buch.-Ham. and *Thespesia populnea* (L.) Sol. ex Correa. Besides, shrubs and undershrubs like *Calotropis gigantea* (L.) R. Br., *Cassia auriculata* L., *C. occidentalis* L., *Jatropha curcas* L., *J. gossypifolia* L. and *Vitex negundo* L., are quite common. *Cissus quadrangularis* L., *Coccinea grandis* (L.) Voigt and *Pergularia daemia* (Forsk.) Chiov. are the climbers frequently met with. *Ammannia baccifera* L., *Bacopa monnieri* (L.) Wettst., *Centipeda minima* (L.) A. Br. & Aschers., *Coldenia procumbens* L., *Dentella repens* (L.) J. & G. Forst., *Eclipta alba* (L.) Hassk., *Gisekia pharnaceoides* L., *Sphaeranthus indicus* L., *Tribulus terrestris* L. and *Vicoa indica* (L.) DC. contribute to the weed flora of the plains.

In the numerous tanks and irrigation canals there is a rich hydrophytic vegetation. Some of the common hydrophytes are *Aponogeton natans* (L.) Engl. & Krause, *Eichhornia crassipes* (Mart.) Solms, *Nelumbo nucifera* Gaertn., *Nymphaea nouchali* Burm. f., *N. pubescens* Willd., *Nymphoides cristata* (Roxb.) O. Ktze., *N. indica* (L.) O. Ktze. and *Pistia stratiotes* L., *Salvinia molesta* Mitchell intruded into many tanks, canals and backwaters. *Struchium sparganophorum* (L.) O. Ktze., an alien weed and a new entrant to the Indian Flora (Vasudevan, 1967) is commonly seen along the banks of the Tambaraparani river at Kuzhithurai and Munjirai regions.

Southern tropical dry deciduous forests :

These forests occur at an altitude ranging from 200 to 800 m and can be seen in places like Keeriparai, Mangalamottai (Lower Kodayar), Ulakkaruvi near Alagiyapandipuram, Maruthamparai beat of Kulasekharam range and Kuttiyar region of Pechiparai. For raising Rubber plantations the forests in some of the above areas have been cleared by the Forest Department. In the undisturbed patches the following trees and shrubs occur : *Adina cordifolia* (Roxb.) Hook. f. ex Brandis, *Cochlospermum religiosum* (L.) Alston, *Dillenia pentagyna* Roxb., *Hydnocarpus laurifolia* (Dennst.) Sleumer, *Hymenodictyon excelsum* (Roxb.) Wall., *Lannea coromandelica* (Houtt.) Merr., *Semecarpus anacardium* L. f., and *Terminalia chebula* (Gaertn.) Retz., *Desmodium triangulare* (Retz.) Merr. var. *congestum* (Wight & Arn.) Sant., is noticed as a forest undergrowth. *Aeginetia indica* L. and *A. pedunculata* (Roxb.) Wall., the root parasites, have also been collected from this region. *Cheilanthes keralensis* Nair & Ghosh has been relocated in its type locality—near Keeriparai.

Southern tropical moist deciduous forests :

These are met with around Kilaviarumalai and Kalikesam river near Balamore and Vallachithodu at Lower Kodayar at an altitude of about 500 m. The forests are thick and virgin. *Calamus* sp. is inconspicuous. The common trees include *Acronychia pedunculata* (L.) Miq., *Alstonia scholaris* (L.) R. Br., *Scleropyrum wallichianum* (Wight & Arn.) Arn. and *Vateria indica* L. The lianas *Gnetum ula* Brongn. and *Derris thyrsiflora* (Benth.) Benth.. var. *eualata* (Bedd.) Thoth. occur. *Remusatia vivipara* (Roxb.) Schott in flower has been observed in Vallachithodu. *Begonia floccifera* Bedd. and *B. malabarica* Lamk., are abundant in Vallichithodu and Kilaviarumalai.

Southern tropical wet evergreen forests :

Otherwise called *shola* forests, these appear on the way to and at Muthukuzhivayal and Upper Kodayar, Mahendragiri, etc., above 800 m. These forests are seen often in between or bordering the grasslands. Though much of the forest areas have been cleared, certain patches at Muthukuzhivayal are still very dense. The trees are tall with huge trunks. Due to the moisture and heavy rains in these regions epiphytic orchids are abundant. Some of the common trees and shrubs met with are : *Aglaia bourdillonii* Gamble, *Cullenia exerillata* A. Robyns., *Dimocarpus longan* Lour., *Elaeocarpus munroii* (Wight) Mast., *E. tuberculatus* Roxb., *E. venustus* Bedd., *Garcinia travancorica* Bedd., *Ligustrum travancoricum* Gamble, *Symplocos laurina* (Retz.) Wall. ex Rehd. & Wills., *Trichilia connaroides* (Wight & Arn.) Bentvelzen, *Vernonia monosis* DC. and *V. travancorica* Hook. f. Common climbers include *Embelia basal* (Roem. & Schult.) A. DC., *Smilax zeylanica* L., *Tetrastigma sulcatum* (Lawson) Gamble and *Zanthoxylum tetraspermum* Wight & Arn. *Aeschynanthus perrottetii* DC. and *Hoya pauciflora* Wight are the common epiphytes of this region.

Grassy Swards :

These occur in places like Muthukuzhi, Mahendragiri and Upper Kodayar (Winch Side) at high altitudes. Some of the common grasses here are *Chrysopogon orientalis* (Desv.) Camus, *Eulalia phaeothrix* (Hack.) O. Ktze., *Themeda tremula* (Nees ex Steud.) Hack. and *Zenkeria* sp. Amidst grasses, and also in the crevices of rocks, numerous *Impatiens*, Orchids and Ferns grow luxuriantly; other herbs met with include *Acrotrema arnottianum* Wight, *Centratherum rangachari* Gamble, *Exacum travancoricum* Bedd., *Leucas vestita* Benth., *Linum mysurense* Heyne, *Hedyotis purpurascens* Hook. f., *Heracleum candolleanum* (Wight & Arn.) Gamble, *Senecio ludens* Cl. and *Smithia blanda* Wall. ex Wight & Arn. On dripping rocks *Utricularia roseo-purpurea* Stapf ex Gamble and *Utricularia reticulata* Smith are commonly seen.

The present studies have revealed that many novelties, as also several rare, endemic, endangered and interesting plants occur in this district. A new *Hoya viz. H. kanyakumariana* Henry & Swamin., was described (Henry &

Swaminathan, 1979). Apart from the above, in recent times many new plants have been described from this district : *Cheilanthes keralensis* Nair & Ghosh, *Fimbristylis longistigmata* Govindar., *F. rugosa* Govindar., *Jatropha maheshwarii* Subr. & Nayar, *Ophiorrhiza tirunelvelica* Henry & Subr., *Polygala raoi* R. N. Ban. & L. K. Ban. and *Scleria lithosperma* (L.) Sw. var. *multispiculata* Govindar. During the present studies most of the above have been relocated from their type localities; also *Euodia lunuankenda* (Gaertn.) Merr. var. *tirunelvelica* Henry & Chandrab., *Hedyotis gamblei* Henry & Subr., *Janakia arayalpathra* Joseph & Chandras. and *Tylophora subramanii* Henry have been located in this district outside their type localities.

Several species known to be endemic to Kanniyakumari and Tirunelveli districts of Tamil Nadu and adjoining regions of Kerala have been discovered after a lapse of 80-100 years (Henry & Swaminathan, 1980). Some of these are : *Byrsophyllum tetrandrum* (Bedd.) Hook. f. ex Bedd. *Didymocarpus missionis* Wall. ex R. Br., *Elaeocarpus venustus* Bedd., *Morinda reticulata* Gamble and *Vernonia heynii* Bedd. ex Gamble. *Bentinckia condapanna* Berry ex Roxb., is seen abundantly in the cliffs of rocky slopes at Upper Kodayar. *Decussocarpus wallichianus* (Presl) De Lauben., the only native conifer of Peninsular India was also collected in the *sholas* of Muthukuzhivayal. The collection of *Flagellaria indica* L., is an addition to Gamble's *Flora of the Presidency of Madras.* This district is rich in orchids; some of them collected recently include *Aphyllorchis prainii* Hook. f., *Arundina graminifolia* Hochr., *Brachycorythis splendida* Summerhayes, *Cirrhopetalum gamblei* Hook. f., *Coelogyne nervosa* A. Rich., *Cymbidium ensifolium* (L.) Sw. var. *haematodes* (Lindl.) Trimen (a terrestrial, showy, Sri Lanka orchid), *Eria mysorensis* Lindl., *Habenaria longicorniculata* Grah., *Malaxis densiflora* (A. Rich.) O. Ktze., *Peristylus stenostachyus* Krzl., *Polystachya flavescens* (Bl.) J. J. Sm., *Porpax jerdoniana* (Wight) Rolfe, *Saccolabium jerdonianum* Reichb. f., and *Satyrium nepalense* D. Don.

A detailed flora of this district is under preparation. It is unfortunate that the rich flora and fauna of this district are disturbed due to clearing of forest areas for hydro-electric projects, raising of plantations like Rubber, Cardamom and urbanisation. In upper Kodayar and Lower Kodayar a major portion of the rich forests has been cleared for the Kodayar Hydro-electric Project. Vast forest areas have been cleared in Keeriparai, Pechiparai, Perunchani and surrounding regions for raising Rubber Plantations which are further extended. It is essential to protect the rich but vanishing flora of this district.

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